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Review of Fatal Injuries in the Petroleum Industry for 1982

JUNE 1983

American Petroleum Institute
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Statistics Department

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50TH ANNUAL REVIEW OF FATAL INJURIES AS REPORTED BY THE PETROLEUM INDUSTRY TO THE AMERICAN PETROLEUM INSTITUTE FOR 1982

On-Duty Fatalities

One hundred and forty-four oil and gas companies and their subsidiaries, employing 495,000 workers, reported 57 on-duty fatal accidents during the year 1982. This is equivalent to one fatality for every 8,684 workers employed, compared with 9,755 in 1981.

Companies submitted detailed information on the causes of 48 of the fatal on-duty accidents. This information is reviewed herein. An increase occurred in the number of deaths where motor vehicles were involved, with 17 reported for 1982 compared with 16 in 1981.

Fatal on-duty accidents for 1982 are summarized, by functions and causes, and are compared with similar data for 1981 in Table 1.

TABLE I

Fatalities by Functions and Causes, Years 1982 and 1981

	Cases Reported		Fire and Explosion		Struck by Equipment		Motor Vehicle		Aircraft		Other Causes	
	1982	1981	1982	1981	1982	1981	1982	1981	1982	1981	1982	1981
Total	48	43	6	10	8	4	17	16	5	1	12	12
Function:												
Exploration and Production	15	9	1	2	2	0	8	4	4	0	0	3
Gas Processing	1	1	0	0	1	1	0	0	0	0	0	0
Drilling	2	1	0	0	1	1	1	0	0	0	0	0
Chemicals	2	1	0	0	1	0	0	0	0	0	1	1
Refining	6	7	0	4	0	0	0	2	0	0	6	1
Marketing												
Wholesale	5	10	1	3	0	0	3	5	0	0	1	2
Retail	6	3	0	0	0	0	3	0	0	0	3	3
Pipeline												
Crude & Products	2	5	0	1	1	0	1	4	0	0	0	0
Gas	7	4	4	0	2	2	1	0	0	0	0	2
Marine	1	0	0	0	0	0	0	0	0	0	1	0
Research and Development	0	0	0	0	0	0	0	0	0	0	0	0
Engineering and General Services	0	1	0	0	0	0	0	1	0	0	0	0
Miscellaneous	1	1	0	0	0	0	0	0	1	1	0	0

EXPLORATION & PRODUCTION

Collided with Truck

The fatality was the result of a vehicle accident. An oilfield tractor and trailer pulled from a restaurant parking lot and the company driver hit the trailer broadside, shearing off the top of the automobile.

The employee failed to apply the brakes in time to avoid the accident. The truck was not visible from a safe distance.

Helicopter Collision

The fatality was due to a mid-air collision of two helicopters. Although the wreckage was recovered, the employee is still missing. The weather was clear with a visibility of ten miles.

Head-On Collision

The employee was returning to a rig site, on a lease gravel road, at dusk. While travelling in the center of the road, he collided head-on with an on-coming service vehicle as he reached a hill crest. The employee died on impact.

While the lease roads are usually traffic free, safe driving practice is still valid on remote roads.

Collision

The employee was returning to the office in a company car. The employee was travelling north on a highway and, upon entering a shallow curve, was struck head-on by a south-bound vehicle in the north-bound lane. The employee died instantly of massive internal injuries believed caused by the impact with the steering column. The employee was wearing his seat belt and was travelling below the posted speed limit.

An eyewitness, in a vehicle behind the company car, stated that the employee in no way contributed to the cause of this accident and did not have time to apply his brakes. The driver of the other vehicle was cited for negligent homicide.

Explosion

A contract construction crew was completing modifications to a natural gas tank battery when one of the tanks exploded. The tank battery was destroyed by fire. One employee was on site at the time of the explosion. He received second and third degree burns on 60% of his body. The employee died 11 days later.

This accident is currently under investigation. The source of ignition has not been determined.

Mechanical Failure

The employee was inbound from an offshore platform on a regular crew change flight. Due to mechanical failure, the helicopter was forced to make an emergency landing. Upon landing, 12 ft. seas caused the helicopter to invert and it eventually sank with one employee inside. The employee drowned.

Eleven of the twelve people, on board the helicopter, got out. There was no evidence, upon recovery of the helicopter, to support a reason for the employee not being able to get out. The helicopter sank after being buffeted by the high seas for approximately 30 minutes.

Helicopter Crash

A helicopter pilot and three employees, after making routine field platform checks, were making their final approach to the main platform when the helicopter crashed into the water and short of the platform. All four men survived the crash and escaped the craft before it sank. Two men were rescued but apparently the other two went into shock and drowned in the eight to ten ft. seas before they could have been rescued by boat. All four men were wearing life preservers.

Contributing factors:

Cold front moving through the area

A. Thunderstorms
B. Wind gusts
C. Fog
D. Poor visibility

Piping Struck Employee

While attempting to break a freeze in a production line, the employee opened a 2 inch lubricator valve to blow down a 2 inch inlet line to a dehydration unit. When the freeze broke, approximately 970 psi pressure hit the blow-off with a force, which caused a 2 inch piping to strike the employee in the chest.

It is not company policy to install additions or make changes to effect the gas flow from any lubricator or blow-off riser. The employee installed a piping extension on a 2-inch lubricator, changing the flow of gas stream at a 90 degree angle.

Struck a Tree

An area office employee was fatally injured when the company car he was driving sideswiped an oncoming truck and struck a tree.

Struck by Equipment

The company employee and two contractor employees were repairing an actuator on a globe valve in a 1000 psi gas line. They had removed the pressure from the line by closing an upstream ¼ turn block valve which had a 4 ft. extension handle. As the company employee was removing the globe valve bonnet, the block valve handle was accidentally bumped or pushed into the open position. The bonnet of the globe valve blew off (now under 1000 lbs. pressure) and struck the employee in the face.

The accident was the result of accidental pressurization and escaping gas.

The mineral management service of the Department of Interior has suggested that one possible method of prevention would be to replace the handle on the upstream blocking valve with a wheel.

Fatal Internal Injuries

The employee was a passenger in a pickup truck which was involved in an accident at a rural intersection. The employee received internal injuries.

The accident could have been prevented with greater practice of defensive driving and the use of seat belts.

Tractor Trailer Accident

The employee hit a tractor trailer, at dusk, that was attempting to turn at an interstate access road intersection. It was drizzling at the time of the accident.

The driver was going too fast for the weather conditions.

Struck Transport Truck

The employee came over the rise of a hill at night. The vehicle went under a gasoline transport truck that was attempting to reverse across the highway into a rural gas station.

The gasoline transport truck had blocked the highway at night without utilizing any means to alert motorist coming over the hill.

Killed Instantly

The employee was driving a company car on a state highway at 2:00 a.m. and apparently fell asleep at the wheel. His car crossed over the centerline and ran head-on into a tractor trailer rig. The employee was killed instantly.

A contributing factor was that the employee had worked approximately 19 hours that day.

GAS PROCESSING

Killed in Explosion

An engine had been overhauled and the employee and service personnel were in the process of testing engine shutdown devices. The compressor which the engine drove had not been loaded. The engine started and shutdown several times. After it had been running a few minutes on the last start up, a detonation occurred in the third stage discharge piping of the compressor. The employee was killed by fragments of the piping which hit him.

The compressor interstage cooler had air in the piping from being disconnected during the overhaul of the engine. Additionally, a ¾" vent valve on the second stage suction piping was opened to the atmosphere. The second stage suction scrubber had condensate in it which most likely provided fuel for the detonation. Air was apparently not completely purged from the system and a flammable mixture developed with condensate vapors and auto ignition subsequently occurred as a result of the heat which developed during the compression cycle.

DRILLING

Poor Visibility

The fatality was the result of a head-on vehicle accident. The accident occurred on lease road when a pickup passed a convoy of service trucks and hit the company vehicle head-on. The road was unimproved and a severe dust storm was in progress. Visibility was very limited.

Mooring Line Snapped

The employee was assisting in tying up a drilling rig, which was on a barge, to dock in the shipyard. A 3" diameter mooring line snapped, striking the employee and killing him instantly. The employee was standing 12 ft. to the side of the line, but the way it broke allowed the end to swing around the mooring bit to the side.

The line was attached before the vessel stopped moving causing excessive strain on the line. The employee was doing an unfamiliar job to "help out."

CHEMICAL

Electrocuted

Following an electric motor replacement, the employee checked the rotation and determined that the motor leads needed to be reversed on the load side of the contractor which was inside the motor starter housing. The employee opened the wrong starter housing and contacted energized electricals and was electrocuted.

The housings were correctly marked. The employee had been trained and was experienced in this work. The voltage test instrument was at the job site, but unused. The only known prevention would be greater individual alertness.

Struck in Chest

A filter screen for polymer on an injection molding machine was being purged. A plug from the purge valve blew out under pressure and struck employee in the chest, resulting in death.

The accident was reviewed with other employees. The employee had not followed the procedure in which he had been trained.

REFINING

Fatal Fall

The employee fell from the 40 ft. level of the refinery's East Coker. He received a number of severe injuries. He died seven hours later.

The accident is still under investigation.

Fatally Burned

Five employees were in the process of bringing a unit on line when the line separated and sprayed hot catalyst on the employees. All five employees were fatally burnt.

Exact cause unknown.

MARKETING—WHOLESALE

Fatally Shot

The employee was killed while making a residential delivery. Occupants, at the home where the delivery was being made, reported that they heard a sound like a shot. A neighbor saw the employee lying on the ground and, after investigating, called the police. The police department confirmed that death was due to a gunshot wound.

Struck Broadside

The employee, driving a company car, was pulling out from a service station when his car was struck broadside by another car. The employee was fatally injured.

Vehicle Caught Fire

The employee was operating a fully loaded gasoline transport truck when the vehicle left the road, rolled over, and the unit caught on fire. The employee sustained fatal burn injuries.

The cause of this vehicle accident has not been determined and there were no witnesses.

Lost Control of Vehicle

The vehicle accident occurred when the employee lost control on a snow and ice covered roadway. The truck veered to the left, ran off the road across a 30 ft. median strip. He struck an automobile in the southbound lane. The employee had severe fatal crushing injuries.

The cause was a combination of bad road conditions and also the vehicle was accelerating too fast for weather conditions. A Safety Driver Training Program has been implemented.

Suffocation

The employee reported to work and inspected his tractor and trailer which was approximately two-thirds loaded with salt water. He left the yard and drove approximately five miles. The truck drifted to the edge of the road and turned over. An autopsy indicated that there were only very minor injuries and that the cause of death was suffocation.

The cause of this death is unknown. The autopsy indicated a high level of carbon monoxide in the blood. The source of carbon monoxide is unknown, however, an unvented gas space heater in the employee's apartment is a suspected source.

MARKETING—RETAIL

Shooting

The employee was shot during an attempted auto theft.

The cause of death was the violent actions of outsiders (non-company employees).

Automobile Accident

The employee had requested to leave the work site. Permission was granted and the employee left the station in his personal car. Upon his return, he either lost control of his car or experienced mechanical failure with his car. As a result, he drove under a flat-bed semi-trailer parked on the shoulder of the road.

The exact cause is undetermined and no preventive actions can be recommended as this was a "freak" occurrence.

Foggy Conditions

The fatal accident occurred during a very foggy evening. The vehicle left the road and collided with a tree.

The accident was apparently due to a fog pocket. Our employees were counselled and cautioned on driving during inclement weather conditions. A Safety Driver Training program has been implemented.

Employee Shot

The employee was shot while on duty by persons unknown. There were no witnesses.

Improper Crossing of the Street

The employee was crossing the street at a place other than a marked intersection. He stepped from behind a parked vehicle into the path of an oncoming vehicle.

The cause was improper crossing of a street during heavy traffic. It can be prevented by the use of properly marked intersections when crossing streets.

Shot during Robbery

The employee was murdered during a robbery.

PIPELINE-CRUDE & PRODUCTS

Collision

The employee was returning from a job-site in a company vehicle. He was hit head-on by an oncoming vehicle that swerved into his lane.

Struck on Head

The employee was installing fittings to drain water from an 8 inch product pipeline. While employee was opening valve, the threads stripped on a 2 inch nipple allowing the nipple and valve to blow out of a saddle connection. The connections struck the employee in the head, causing his death.

This accident could be prevented by inspecting all connections for proper thread makeup and by proper positioning when opening pressure connection.

PIPELINE—GAS

Explosion and Fire

The unit (an engine and eight compressors) was pressurized and ran for about 30 minutes. The unit was shut down and left pressurized for several days, over which period gas accumulated in the engine room from gas compressor leaks. The engine room was not equipped with gas detectors and had poor ventilation due to some wall and possibly the roof louvers being closed. As the unit was being started, there was an ignition source, and an explosion occurred. The roof louvers and roof panels were blown off. There was significant building wall damage and all five employees in the building were severely burned. Three employees died.

The cause of the accident was that there were sufficient number and quantity of leaks which caused gas to accumulate in the building and to be ignited when the unit was being started. Gas detectors in the building would have prevented this accident.

Vehicle Accident

An employee stopped at a traffic light at an intersection. When the light turned green, employee proceeded through northward bound and was hit broadside on the driver side of company pick up by an eighteen wheel gravel truck, which ran the red light.

Had the employee looked both ways before proceeding through the green light at the intersection, he would have seen that the truck was not going to stop, because a red light or a stop sign does not guarantee what another driver would do.

Hit by Trap Door

Two employees placed a cleaning device, known as a Poly Pig, into a 22 inch diameter sending barrel, 12 ft. long, of a natural gas pipeline. The same crew had been cleaning lines for two days prior to this time. After the Poly Pig was inserted, the barrel was pressurized from a 6 inch natural gas feedline. When the sending barrel equalized with the 20 inch line pressure, the 20 inch block-gate-valve was opened to allow the Poly Pig to be pushed by the pressure through the block-gate-valve into the 20 inch line. After the

Poly Pig was confirmed going through the 20 inch gate valve, the 6 inch supply gas valve was closed along with the block-gate-valve. The 12 ft. sending barrel had between 830 and 890 pounds of pressure and should have been vented through the 6 inch blow off valve to allow depressurization before the 22 inch trap door was opened to confirm the Poly Pig leaving. This venting procedure was not done. The 22 inch trap door was opened under pressure. Both employees were struck by the 22 inch trap door and were pronounced dead on arrival at the hospital. There was a pressure release without fire.

Training has been held on proper procedures to be used during this operation to prevent future occurrences. Other preventive measures are still under consideration.

Explosion

The employee had finished loading a truck with natural gasoline and, after shutting off the loading pump and outlet valves, was disconnecting hook up hoses when an explosion occurred.

All loaders were instructed that the engines on trucks are to be shut down during loading procedures and that all truck and loading line valves are to be closed before restarting engines.

MARINE

Fatal Fall

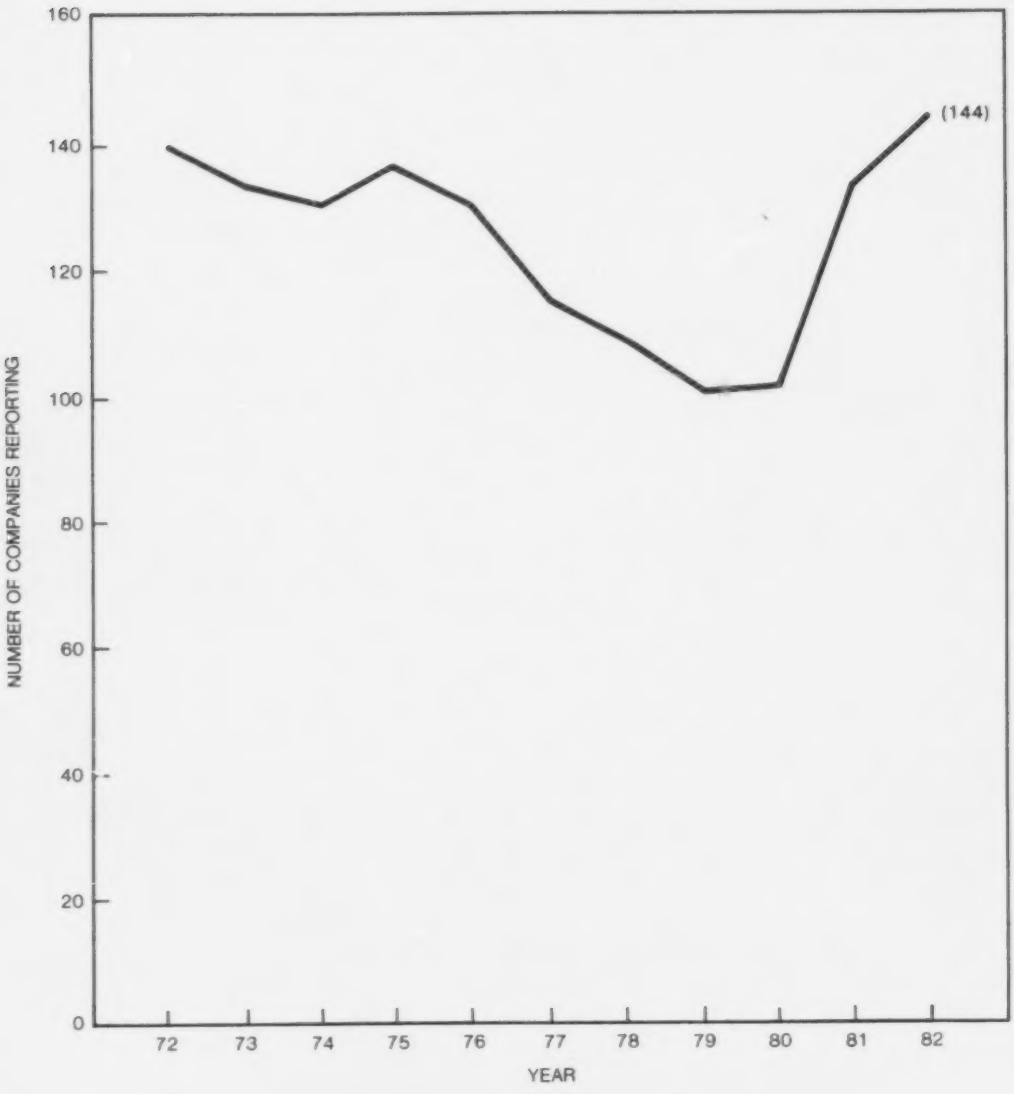
The employee was off duty and the ship was docked. For unknown reasons, the employee was on a catwalk in the engine room and fell off, hitting a turbine cover approximately 40 feet below.

MISCELLANEOUS

Plane Crash

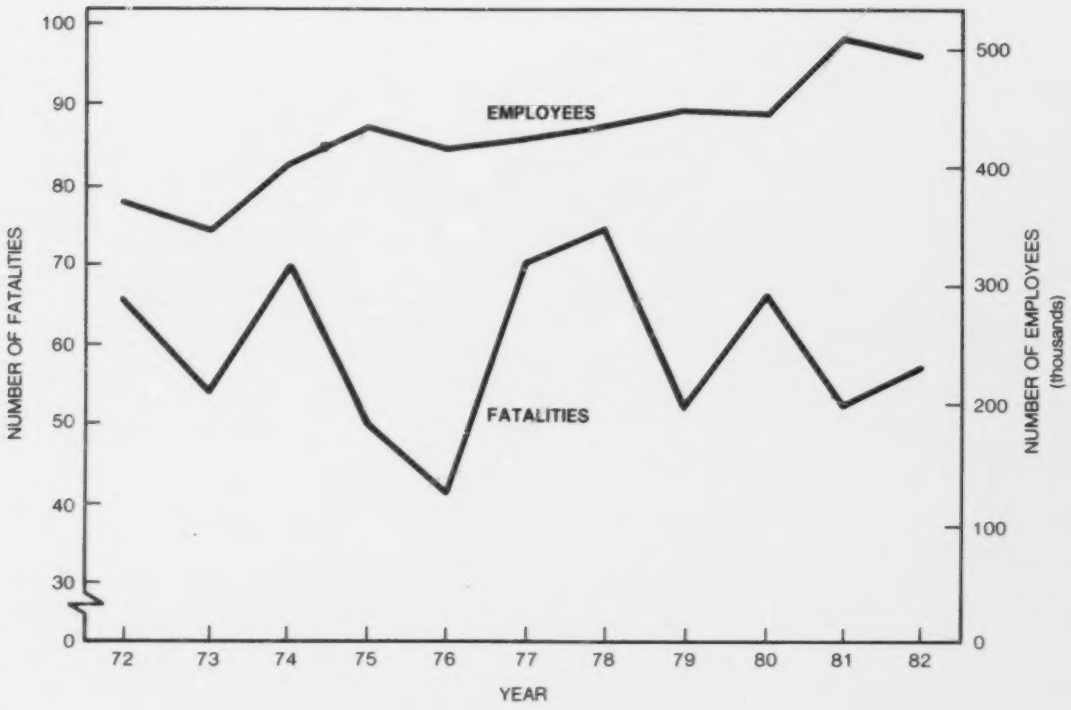
The employee was piloting his private plane to inspect the microwave system along an oil pipeline. The plane crashed on takeoff.

Cause unknown.



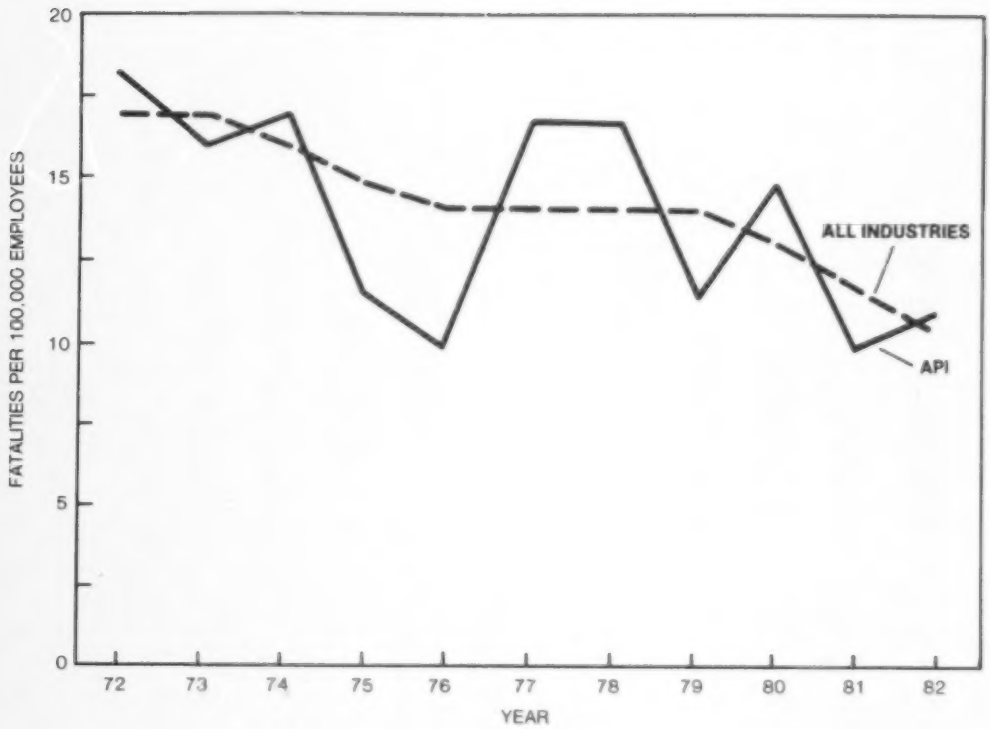
Company Participation in API Fatality Data Collection

NOTE: To facilitate comparisons, the scale for this curve is the same as that used for the participation curves in the other three fire and safety reports.



Fatalities vs. Number of Employees

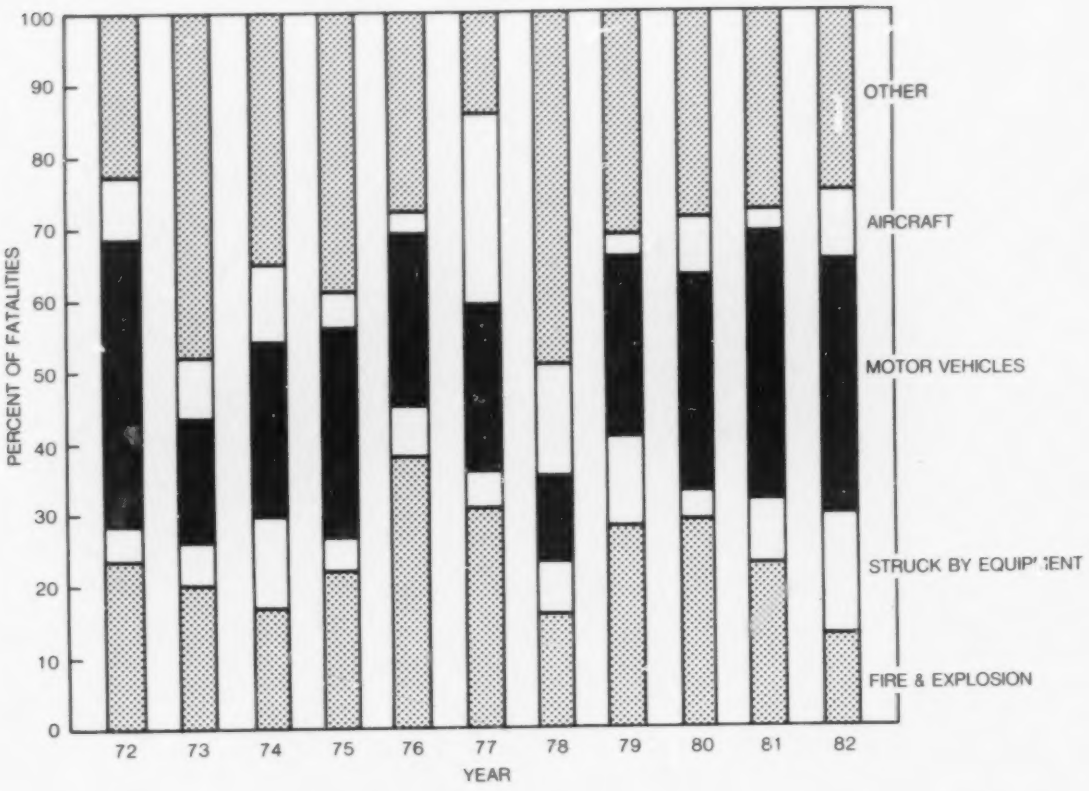
NOTE: The fatality and employee data are those submitted by reporting companies and not industry-wide estimates.



Fatality Rate

NOTES: There appears to be a significant downward trend over the past decade.

Fatality rates for "all industries" were obtained from the National Safety Council, "Accident Facts," 1982 edition; the rate for 1982 is the National Safety Council's estimate for that year.



Fatality Percentages by Type of Incident

NOTE: The percentages are based on the subset of reported fatalities for which the type of incident was specified. The years 1978 and 1979 had the lowest percent of fatalities for which the detailed data were provided.

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